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(74) Agent: LE ROUX, Marius; D M Kisch Inc, P.O. Box 781218, 2146 Sandton (ZA).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

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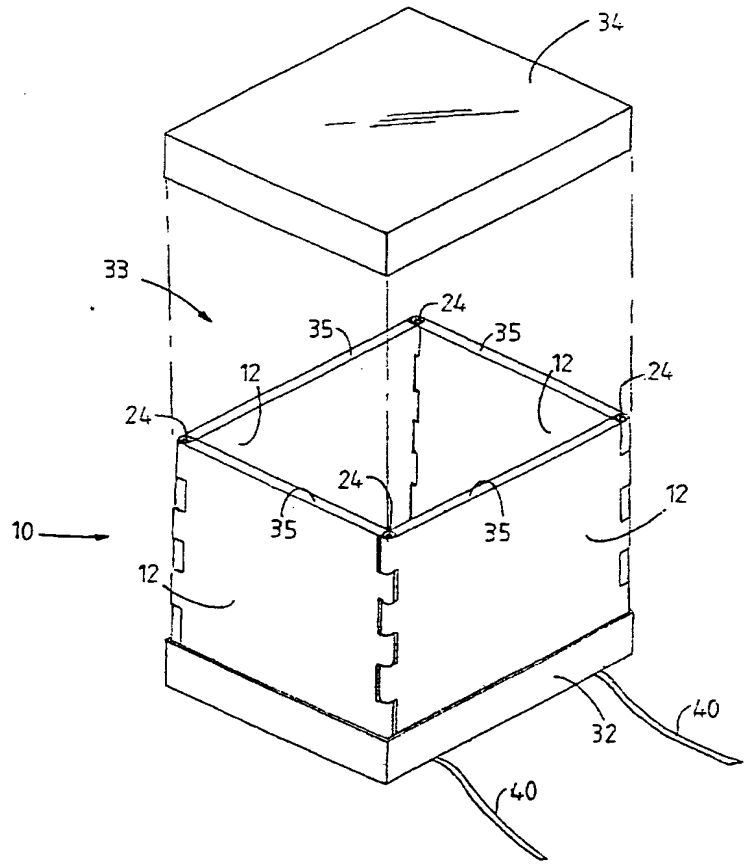
*[Continued on next page]*

(54) Title: A PANEL FOR A COLLAPSIBLE CONTAINER




(57) Abstract: This invention relates to a panel for a collapsible container and to a container formed with a number of such panels. The panel for a collapsible container consists of a panel body having at least one castellated edge defining a number of interlocking formations on the edge of the panel body. The interlocking formation is arranged to interleave with complementary interlocking formations on an edge of an adjacent panel. The interlocking formation has an aperture for removably receiving an engagement member there through so that complementary interlocking formations on adjacent panels are held together in their interleaved position.



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# A PANEL FOR A COLLAPSIBLE CONTAINER

## FIELD OF THE INVENTION

This invention relates to a panel for a collapsible container and more particularly, but not exclusively, to a panel for a collapsible container for use in packaging and transportation. This invention further extends to a collapsible container formed with a number of the panels.

## BACKGROUND TO THE INVENTION

In order to cut shipping costs, re-usable containers are used to ship articles. Empty containers are shipped back to the owner or supplier for re-use thereof. The empty containers take up large volumes of empty space that makes shipping thereof expensive.

Collapsible, re-usable containers provide a less expensive alternative to non-collapsible, re-useable containers. Collapsible containers are not always rigid and strong enough for frequent re-use.

## OBJECT OF THE INVENTION

An object of the present invention is to provide a panel for a collapsible container which, at least partially, alleviates some of the abovementioned difficulties.

## SUMMARY OF THE INVENTION

In accordance with this invention there is provided a panel for a collapsible container comprising a panel body having at least one castellated edge defining a number of interlocking formations on the edge of the panel body, the interlocking formations being arranged to interleave with complementary interlocking formations on an edge of an adjacent panel; the interlocking formation having an aperture for removably receiving an engagement member there through to interlock complementary interlocking formations on adjacent panels.

Further features of the invention provide for the interlocking formation to be a tube section attached to an edge of the panel body; for an axis of the tube section to be substantially parallel to the edge of the panel; for the tube section to be a cardboard tube; for the tube section is secured to the edge of the panel with an integral extension of a cardboard lamination of the panel extending over the tube; alternatively, for the tube section to be secured to the edge of the panel body with a cardboard section extending around the tube with opposite ends of the cardboard section secured on opposite sides of the panel body.

A still further feature of the invention provides for the interlocking formation to be formed by an extension of part of a lamination of the panel body with an outer edge of

the extension of the lamination folded back and secured to the panel body to define an aperture for receiving the engagement member there through.

Still further features of the invention provide for the aperture to be substantially parallel to the edge of the panel; for the engagement member to be a rod; for the rod to be circular, rectangular or square in cross section; for the rod to be hollow; for the panel to include an engagement member located through the aperture in the interlocking formation; for the panel to be made of cardboard; and for the panel to be laminated.

This invention extends to a container formed from at least three interlocked panels as described above.

Further, operatively lower edges of the at least three panels are located in a tray and operatively upper edges of the at least three panels are located in a lid tray.

The container is made of cardboard.

These and other features of the invention are described in more detail below.

## BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention is described below, by way of example only, and with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a panel for a collapsible container;

Figure 2 is a perspective view of interlocking formations of the panel of figure 1 releasably interlocked with a second panel using an engagement member;

Figure 3 is a perspective view of a collapsible container formed with panels according to the invention;

Figure 4 is a close up perspective view of an interlocking formation of the panel of figure 1; and

Figure 5 is a perspective view of an alternative interlocking formation of a panel according to the invention.

## DETAILED DESCRIPTION OF THE DRAWINGS

With reference to figures 1, 2 and 3, a panel for a collapsible container is generally indicated by reference numeral 10.

The panel 10 has a panel body 12 with castellated interlocking formations 18 on two edges 16 of the panel body 12 thus forming two castellated edges. It will be appreciated that an edge may include only one interlocking formation to interlock with two interlocking formations on an adjacent panel as is described below.

The panel body is laminated and includes outer laminations 66 as is shown in figure 4 and an inner lamination 65. Inner lamination 65 is a honeycomb-type cardboard strengthening member interposed between the outer laminations 66.

Each interlocking formation 18 includes a tube 26 secured to the edge of the panel body 12 with an axis of each tube substantially parallel with the edge of the panel body 12. In this embodiment, the tube is secured with a cardboard section 67 extending around the tube with opposite ends of the section 67 secured to opposite sides of the panel body 12. The tube defines an aperture for receiving an engagement member 24 there through.

Two adjacent panels sections are shown in figure 2. Complementary engagement formations on these two panel sections are interleaved and an engagement member in the form of a rod 24 extends through the tubes 26 of the interleaved engagement formations and interlocks the engagement formations 18.

In figure 3, four panels 10 are releasably interlocked as described above and the operatively lower edges (not shown) of the panels 10 are located in a first tray 32, to form a collapsible container 33. A second tray or lid tray 34 is located over the operatively upper edges 35 of the panels 10 to form a lid. The first and second trays 34, 36 may be secured to the panels 10 with tape sections 40.

The operatively lower edges of the adjoined panels 10 are located in the first tray 32 to form a collapsible container 33. The second tray 34 is located over the operatively upper edges of the panel bodies 12 to form a lid. An article or articles to be shipped is placed in the container and the first and second trays 32, 34 are secured to the panels 10 with tape 40.

On delivery, the tape sections 40 are cut and the lid 36 is removed from the adjoined panels 10. The article or articles are then removed from the container. The rods 24 are removed from the tubes 26 and the panel bodies 12 are disengaged by separating their complementary engagement formations 18. The individual panels 10, the first and second trays 34, 36 and the rods 24 are stacked for return shipment.

Figure 5 shows an alternative embodiment of an engagement formation formed on an edge of a panel 50. In this case the panel a lamination 53 and a double lamination 54. Lamination 53 extends past lamination 54 and on outer edge 55 of lamination 53 is folded back and attached to the panel body such that it forms an aperture for receiving an interlocking member there through. The aperture may be shaped to have a square cross-section. It will be appreciated that lamination 53 may alternatively be folded or bent to form an aperture having a rectangular or circular shape in cross-section. A rod having a similar or different cross-section will be located through the aperture. Lamination 54 may also be folded or bent to form part of the wall of the aperture.

It is envisaged that re-usable packaging will be more cost effective if the empty containers are collapsible so as to not take up unnecessary space during their return shipment.

The container is made of cardboard paper and is biodegradable and may also be recycled. Some municipalities or companies may even offer payment for used containers and/or panels.

The container may be offered with or without a pallet and the rods used may be hollow rods to reduce weight.

It will be appreciated that the invention is not limited to the precise details as described hereinbefore. For example, interlocking formations on adjoining panels may be releasably secured by means of a friction fit; and the engagement member need not be a rod but may be a hook or lockable pin.

## CLAIMS

1. A panel for a collapsible container comprising a panel body having at least one castellated edge defining a number of interlocking formations on the edge of the panel body, the interlocking formation being arranged to interleave with complementary interlocking formations on an edge of an adjacent panel; the interlocking formation having an aperture for removably receiving an engagement member there through to interlock with complementary interlocking formations on adjacent panels.

2. A panel for a collapsible container as claimed in claim 1 in which the interlocking formation is a tube section attached to an edge of the panel body.

3. A panel for a collapsible container as claimed in claim 2 in which an axis of the tube section is substantially parallel to the edge of the panel.

4. A panel for a collapsible container as claimed in any one of claims 2 to 3 in which the tube is a cardboard tube.

5. A panel for a collapsible container as claimed in any one of claims 2 to 4 in which the tube section is secured to the edge of the panel with an integral extension of a cardboard lamination of the panel extending over the tube.

6. A panel for a collapsible container as claimed in any one of claims 2 to 4 in which the tube section is secured to the edge of the panel body with a

cardboard section extending around the tube with opposite ends of the cardboard section secured on opposite sides of the panel body.

7. A panel for a collapsible container as claimed in claim 1 in which the interlocking formation is formed by an extension of part of a lamination of the panel body with an outer edge of the extension of the lamination folded back and secured to the panel body to define an aperture for receiving the engagement member there through.

8. A panel for a collapsible container as claimed in claim 7 in which an axis of the aperture is substantially parallel to the edge of the panel.

9. A panel for a collapsible container as claimed in any one of claims 7 or 8 in which at least part of a second lamination of the panel body forms at least part of a wall of the aperture.

10. A panel for a collapsible container as claimed in any one of the preceding claims in which the engagement member is a rod.

11. A panel for a collapsible container as claimed in claim 10 in which the rod is circular, rectangular or square in cross section.

12. A panel for a collapsible container as claimed in any one of claims 10 or 11 in which the rod is hollow.

13. A panel for a collapsible container as claimed in any one of claims 1 to 9 in which the panel includes an engagement member located through the aperture in the interlocking formation.

14. A panel as claimed in any one of the preceding claims in which the panel is made of cardboard.

15. A panel as claimed in any one of the preceding claims in which the panel is laminated.

16. A container formed from at least three interlocked panels as claimed in any one of the preceding claims.

17. A container as claimed in claim 16 in which operatively lower edges of the at least three panels are located in a tray.

18. A container as claimed in any one of claims 16 to 17 in which operatively upper edges of the at least three panels are located in a lid tray.

19. A container as claimed in any one of claims 16 to 19 in which the container is made of cardboard.

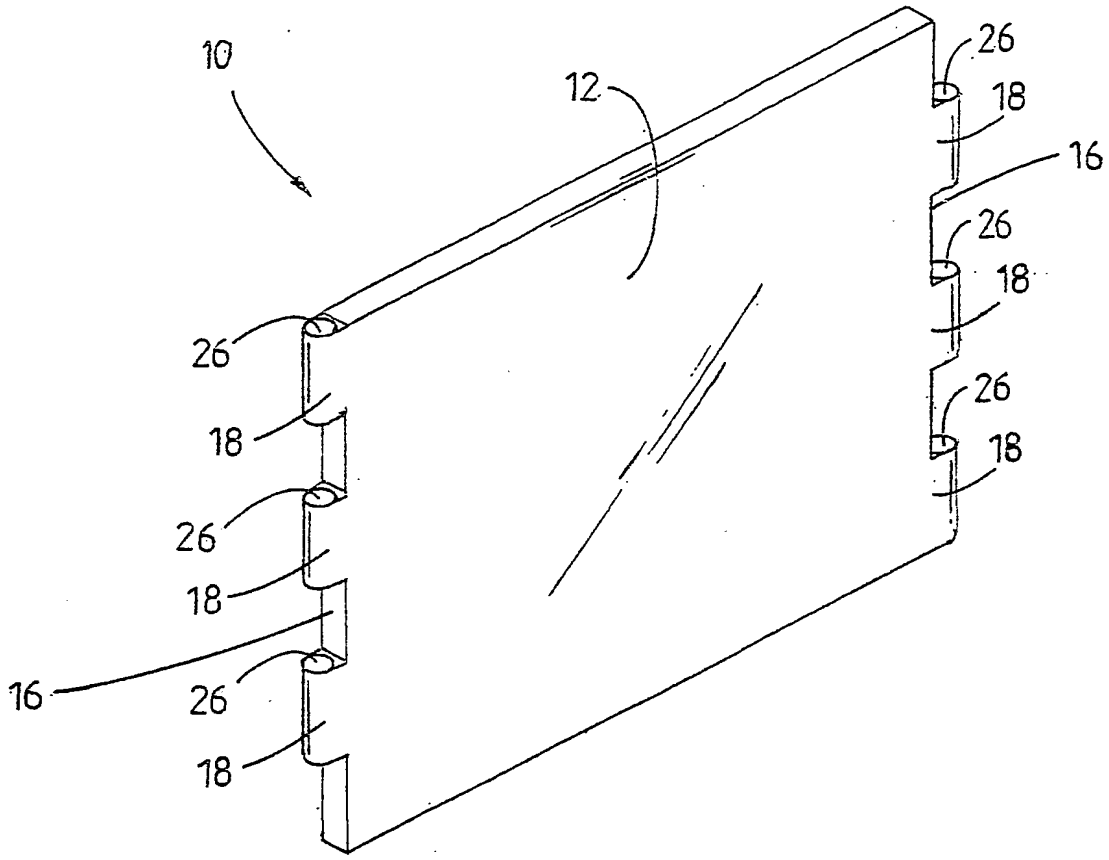


FIGURE 1

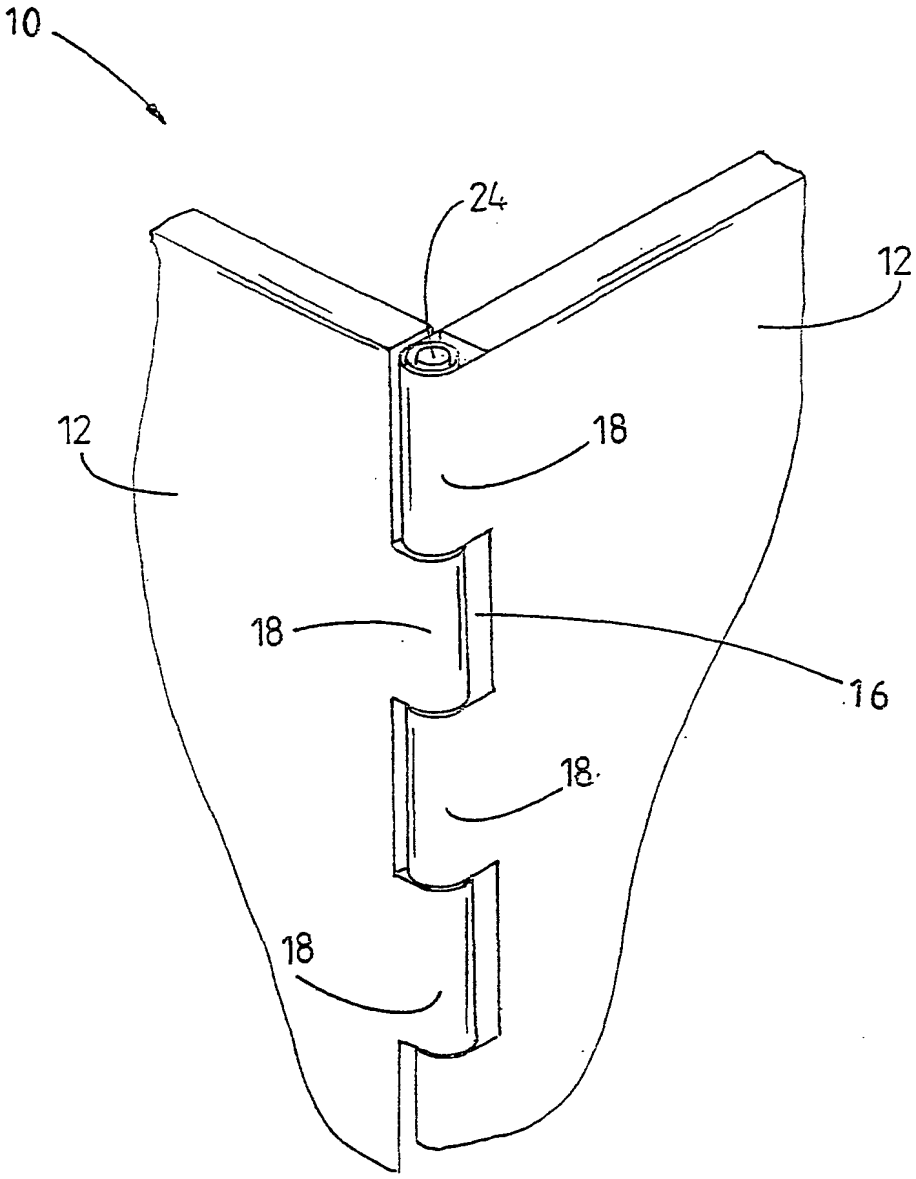


FIGURE 2

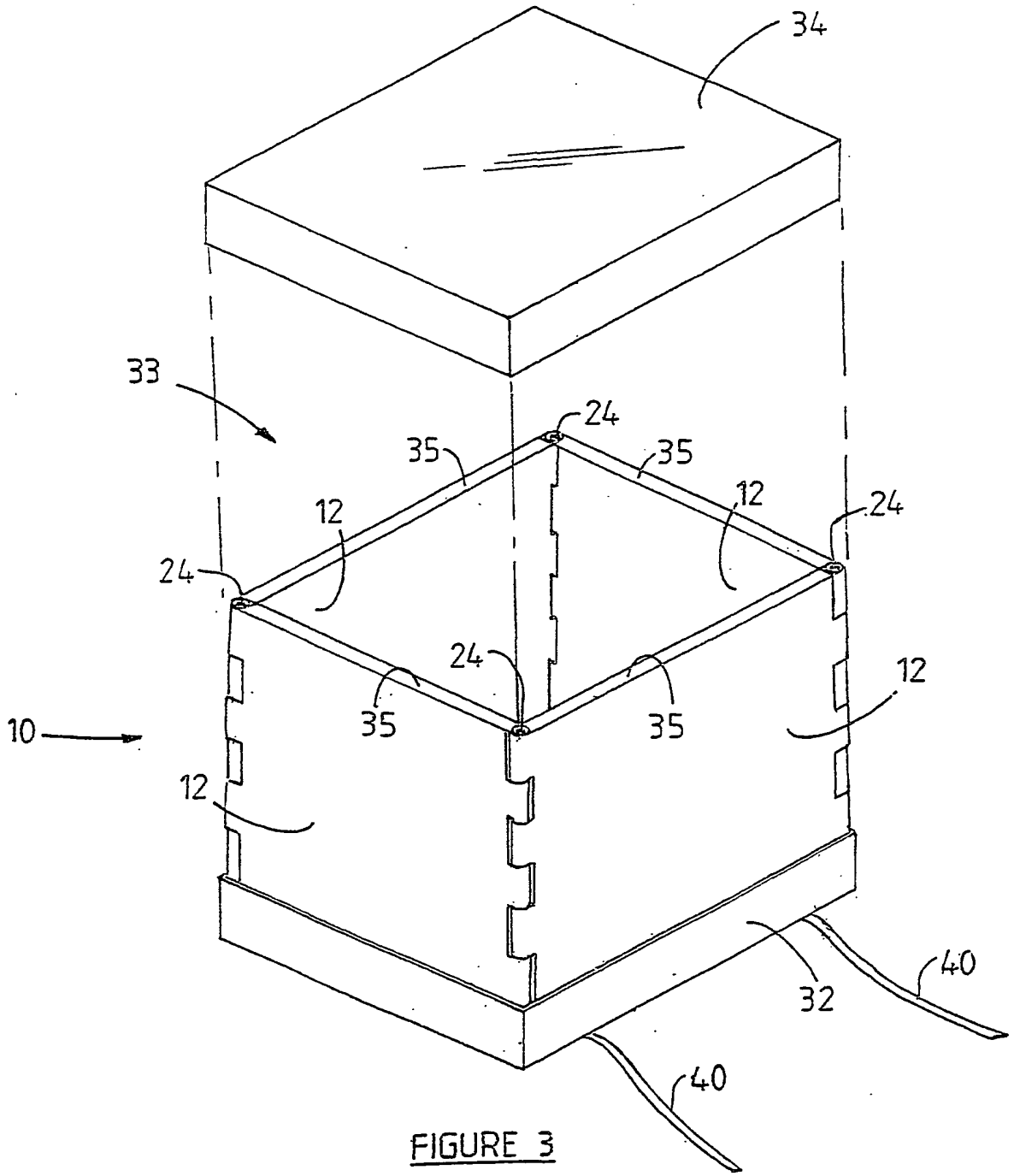


FIGURE 3

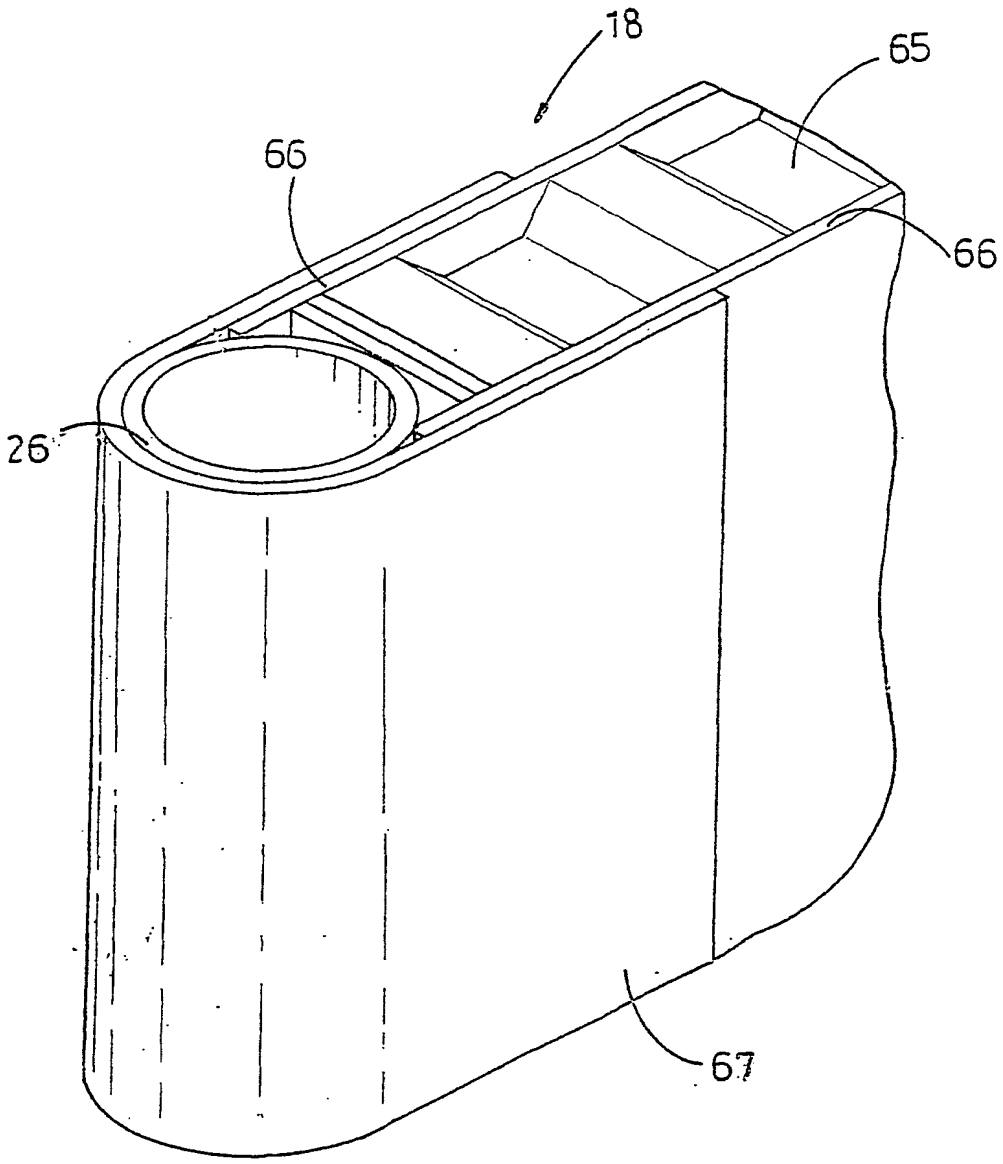


FIGURE 4

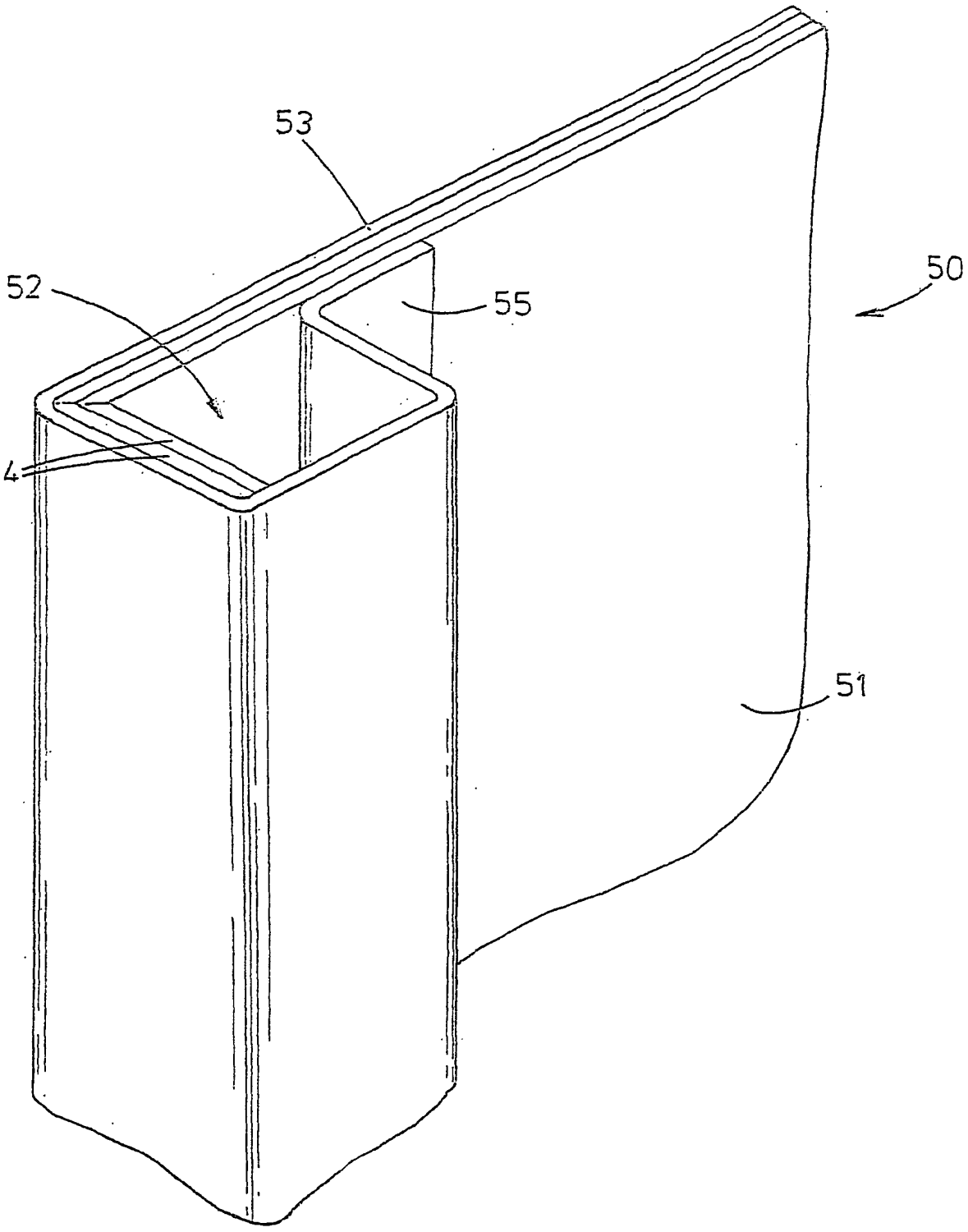


FIGURE 5

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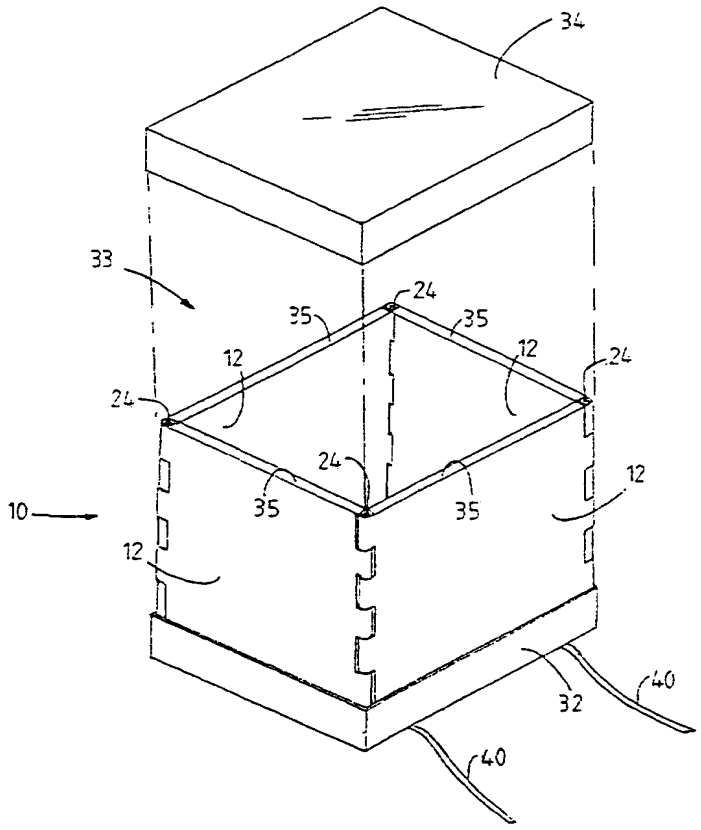


(57) Abstract: This invention relates to a panel (10) for a collapsible container and to a container formed with a number of such panels. The panel for a collapsible container consists of a panel body (12) having at least one castellated edge (16) defining a number of interlocking formations on the edge of the panel body. The interlocking formation is arranged to interleave with complementary interlocking formations (18) on an edge of an adjacent panel. The interlocking formation has an aperture for removably receiving an engagement member there through so that complementary interlocking formations on adjacent panels are held together in their interleaved position.

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D13/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 4 266 670 A (MYKLEBY LAURIE G)<br>12 May 1981 (1981-05-12) | 1,7,8,<br>10,11,<br>13-16,<br>18,19 |
| Y | column 3, line 43 -column 4, line 37;<br>figures 6-8 | 17 |
| X | GB 2 206 280 A (EASTMAN NIGEL GRAHAM)<br>5 January 1989 (1989-01-05)<br>page 5, line 2 - line 20; figure 1 | 1-3,13 |
| Y | US 2 671 601 A (LEAVITT)<br>9 March 1954 (1954-03-09)<br>figure 3 | 17 |

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 24 May 2002 | 05/06/2002 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Bridault, A |

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PCT/ZA 01/00194

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 4266670 A | 12-05-1981 | NONE | |
| GB 2206280 A | 05-01-1989 | NONE | |
| US 2671601 A | 09-03-1954 | NONE | |

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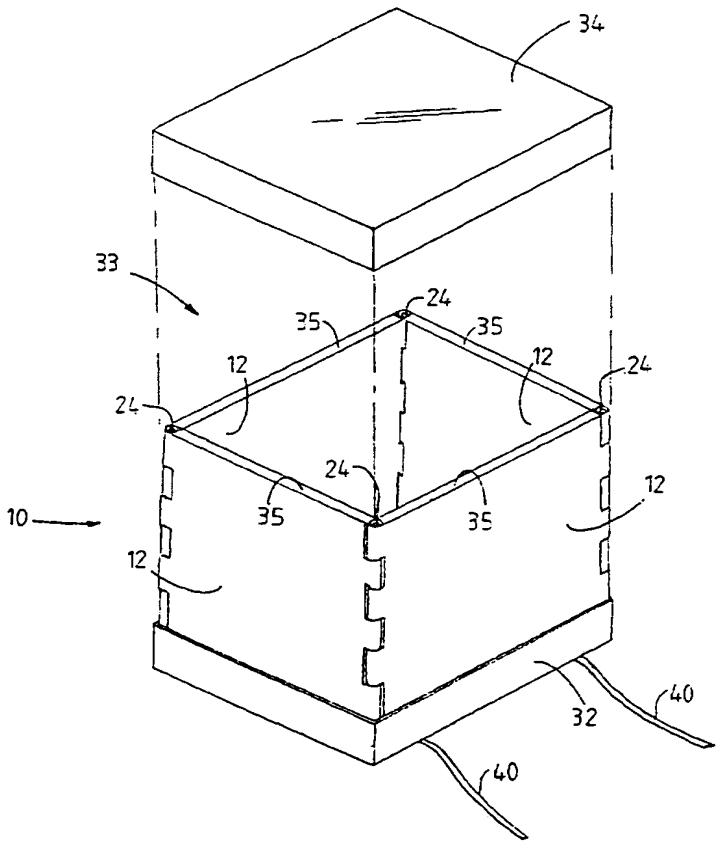


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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D5/42

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B. FIELDS SEARCHED

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IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

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| Y | US 2 671 601 A (LEAVITT)<br>9 March 1954 (1954-03-09)<br>figure 3 | 17 |
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|---|---|
| 19 July 2002 | 22.07.02 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Bridault, A |

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